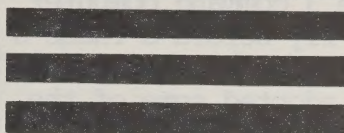




EDITOR:
C. T. WEST, WD4HSI
1611 Craig Street
Raleigh, N. C.



CLUB REPEATER:
WR4ACF (146.04/64)

CLUB CALL:
W4DW



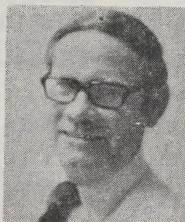
"RALEIGH AMATEUR RADIO SOCIETY NEWS"

OCTOBER 1980

ISSUE 128

LEADING
EDGE

SHERMAN STARNES
W4TZU



The possible future amateur radio satellite featured this month is under development by AMSAT-Italiana. The transponder operates in mode B, 70 cm. uplink and 2 m. downlink. The outstanding characteristic of the Italian design is separation of the receiver passband into segments which are independently automatic gain-controlled. In the past, stations using excessive uplink power activated the receiver AGC and caused everyone's repeated signal to

be attenuated. With independently AGC'ed segments, only the stations in the same segment as the power hog will be attenuated. The transponder prototype performed well in a balloon flight from Sicily to Spain in August of last year. A similar test earlier this year attempted to reach the United States but was terminated over Spain again due to problems not associated with the radio. This project is not in the advanced stage requiring identification of a launch opportunity.

The Phase 3B development schedule has been firmed up and completion is targeted for the first quarter of 1982. This coincides with several possible launch opportunities, notably the Space Shuttle, a military flight and an Ariane launch. Since this information came to light it has become likely that the Shuttle schedule will slip another two months. Leading Edge will report on further developments as they unfold.

The Phase 3 command computer software will fly before a Phase 3 satellite gets up. The University of Surrey has adopted some of the command software for use in the UOSAT discussed in Leading Edge a couple of months ago.

Amateur radio satellite activity behind the Iron Curtain is not without problems. The RS3 and RS4 satellites have apparantly been ready since early this year but now word comes from a Russian source that launch opportunities for this year have been exhausted. Typically, nothing will be certain about these spacecraft until they are up and operating.

OSCAR's 7 and 8 are performing well. Several stations report extremely good downlink signals from the crippled OSCAR 7. The good ten-meter conditions you might have experienced recently have been responsible for numerous reports of anomolous propagation of OSCAR 8's mode A signals.

A real space program is coming your way on PBS television. "Cosmos" is scheduled for 13 one-hour segments beginning on September 28 and continuing each Sunday through December 21. The series, narrated by astronomer-philosopher-author Carl Sagen, explores the cosmos fully, covering such diverse subjects as the origin of life, evolution, space travel, intelligent life and memory. Special effects for the 8 million dollar series were created by the same people

who did "Star Wars". The editors of Sky and Telescope, after previewing the first episode, wrote, "Cosmos" is certain to become the standard against which future science programs will be compared." Sagen always makes a big splash so look for it.

TRAFFIC NOTES

by

Bob Corns, K4MC

The September issue of QST contained an ARL message text you need.

In case you missed it, here it is for you to clip and insert in your message texts file:

ARL Forty-six: Greetings on your birthday and best wishes for many more to come.

Messages are to the National Traffic System what gasoline is to an engine. So put some fuel into the NTS. Send a message.

FOR SALE: Gonset Mark IV
2000 PEP linear amp. \$375.
K4MC

NOVEMBER IS AUCTION TIME

by AA4L

The annual RARS auction is a revered and venerable tradition. To the best of my somewhat shaky recollection, the first such event was convened sometime in the late sixties at the Army Reserve Center. We were just getting organized and desperate for program material, as well as cash. The twenty or thirty attendees had fun, and from that somewhat humble beginning, our present annual extravaganza has grown. Incidentally, the RARS railroad selected W4CQJ (now AA4L) as the auctioneer on that occasion. I had fun, too.

While most of the old timers are very familiar with our auction routine, C.T. has asked me to explain our rules and regulations, customs, and etiquette to the whippersnappers. Read carefully, lest some unintentional breach subject you to embarrassment, or worse. For instance, KA4FEN (now KY4W) scratched his ear at the wrong time. He had to pay fifty cents for the privilege of carrying home three hundred pounds of antique and esoteric electronica.

Rule 1. All are welcome, club member or not.

Rule 2. Unmarked merchandise placed on the table is considered a welcome donation to the club. Proceeds go to the club treasury.

Rule 3. If merchandise is prominently marked with your name and/or call, you will receive the amount paid, less a ten percent transaction fee. The maximum fee is \$2.50. Fees go to the club treasury.

Rule 4. You may mark your merchandise with a minimum acceptable price. The auctioneer will attempt to start the bidding at that figure, and will not accept a lesser bid. No fee will be charged if no bid is received.

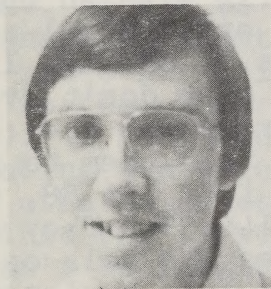
Rule 5. All awards and decisions by the auctioneer, however arbitrary, are final, irreversible, and immutable.

The RARS auction is primarily for fun and for the acquisition of electronic trivia at bargain prices. It is not a good forum for the serious merchandising of transmitters, receivers, or the like (except for apparatus of pre-1950 manufacture, or equipment maintained by N4AWR or otherwise abused). The typical transaction is less than five bucks. A twenty dollar sale is noteworthy, and a fifty dollar bid is downright miraculous. Bring parts, tools, odds and ends, keys, microphones, and the same kind of junk you bought at last year's auction. Non-ham junk such as BC radios, alarm clocks, appliances, old TV sets and the like seem to move fairly well at good prices.

A high minimum asking price always turns off the audience. A much better strategy to move moderately priced merchandise is to set no minimum and to make arrangements with a couple of

buddies to act as shills to get the bidding going. If you can't get your price, then you can always make the final bid yourself.

Bring your junk, bring your friends, bring your small change, and be prepared for anything. A smidgin of nostalgia, a bit of humor, a tad of suspense and scads of bargains make the November meeting the highlight of the RARS Calendar. See you there!



NEWS AND VIEWS

From

NCSU ARC W4ATC
CHARLES OSBORNE, WD4MBK

WHERE HAVE ALL THE

AMATEURS GONE?

Something happened at Shelby to prompt this column's comment.

An older gentleman, whom I had seen at many hamfests, appeared to be selling all of his stock of parts for building. His comment: he just didn't feel like building anymore. He was going to buy a "Jap" rig and be done with it.

That really drives home an idea growing in my mind for some time.

Are we so overwhelmed by current technology that we simply give up under its pressure? Sure there's a lot of work involved in homebrewing, but there is possibly more personal satisfaction now than ever before. Back when everyone built his own gadgetry, you had to do something novel to gain attention. Now you put a capacitor on a CB antenna so it will operate on two meters and you become famous

when a magazine article is written about the way this "feat" was accomplished. Weird! Where are the really novel, complex construction projects, like whole transceivers? A few years ago they became more and more scarce.

I actually suggest buying a "Jap" rig. There is no doubt at all that you are getting amazingly complex equipment at a good price. Advanced technology and a myriad of features grind the inflated American products into the ground. Why buy Collins when you could buy three Icom 701's, test them out, put two on the shelf, and use your leftover cash to improve the antennas. If you experience trouble (considering the thousands of transistors in a rig today, reliability has actually gone up, not down), just pull one of the spare rigs off the shelf and continue operating. If you really looked at what's inside the new transceivers, you'd wonder how it ever got off the assembly line for a few hundred dollars net cost.

In the absence of home-built equipment, pressure is placed squarely on the operator for operating quality. No longer do we

have the rig's peculiarities and antics to blame. We can concentrate on our operating ability and peripheral equipment.

With lessening experimentation and construction, it's no wonder two meter FM has taken on such proportions. No tune-up rigs and scanning memories all spell appliance operator looking for a rig with an on/off switch and channel selector (shades of CB) and little more. Most don't even know what frequency they are on. If you tell them to go up 10 kHz from 146.88, they end up on 146.98. They are also the ones who talk on the calling frequencies and raise Cain when mother nature brings in -- heaven forbid -- DX on the local "machine."

When the FCC gives out licenses to people who don't even know Ohm's law, it is no wonder the quality of conversation on the air is becoming like another band that is itself dying due to an overabundance of no-commitment licenses. The FCC has implied that we, the ham population, are defending code tests as necessary simply because of the old "I went through it, so can you" attitude. A person given something for nothing

seldom respects his gift. We all made a commitment to work and learn enough about communications to be safe on-air operators.

Personally, I took 10 years to finally get my license. I had no hams in my community, no one to tell me to send to ARRL for information, no magazines (QST should be on newsstands). I tried paper tape CW practice in the fifth grade but made no headway. I had to get on the air and experiment with antennas and other things, so I turned to the children's band (CB). (I had been demonstrating electrical projects to other classes at school since the first grade.) Now, I can't believe the amount of money people wasted on radios which couldn't cover 10 miles. When CB is compared to amateur radio, the point is clear. Most of us are lazy, and if ham radio requires such a commitment to learning, some will take the easy way out.

My own problems stem from the trouble I have with French or any other language. I can't do a translation quickly. I need more practice than most people to get my speed up to even five words per minute. I'm

proud of my license and give hame radio as much help as possible in return. It is looked at very favorably on job applications, since most grads have seldom picked up a soldering iron.

Write to the FCC if you feel this serious learning commitment helps keep amateur radio a self-policing service. You treasure what you've worked hard to get.

Remember what amateur radio was founded on: emergency communications and pioneering experimentation. You are a ham who has earned the technical right to try new ideas. Do so. Don't be appliance operators. The "Jap" rigs give you the freedom to experiment in peripheral areas, such as computers, antennas, signal processing, CW generation, narrow band voice modulation, moonbounce, metero scatter, preamps, and on and on. You have a good stable source on which to base your experimental data. Use it in trust, not in awe. Let's try to keep the progressiveness of amateur radio alive.

NOVEMBER
CLUB AUCTION

Profile

WALLY

by

Wallace G. Brame
W4PRP

(Editor's note: Wally's story continues from the September issue of RARS News.)

We were luckier in certain areas than the average public school student. Our music lessons, whether lessons in piano or instrument for orchestra, were taught as part of our regular school curriculum instead of being taught on a private basis at extra cost.

My abundant curiosity and my everlasting interest in electricity almost lead me to disgrace in the sixth grade. I discovered the crystal radio. I was fascinated by the fact that by using a crystal, cat whisker, headphones, antenna, and ground, I could pick up a radio signal. I also was delighted to learn you could play with it and feel of any part of the whole crystal set with no fear of getting

shocked. I let myself become so engrossed in crystal sets and one-tube radio kits and let this interest take up so much study time, I was asked to repeat the sixth grade. It was more than amazing to me to be able to hear a radio station through the air with no power.

To add to my already keen interest, I had an industrial arts teacher who did everything he could to encourage it, going so far as to teach me to build a crystal set. Once he let me borrow his own personal one-tube radio kit. I had a ball with this treasure. I could not resist taking it apart to see what it was made of and how it was put together. I was only 12 or 13, and, needless to say, when I put the kit back together after taking it apart, it didn't work exactly right. I was embarrassed, to say the least. When I returned the radio, I told my teacher I was afraid I had broken the radio and was willing to pay for it. Since I wasn't the first curious little boy the teacher had taught and being the understanding man he was, Mr. Anthony put my fears to rest by telling me not to worry. He said he could fix the radio.

Another advantage in going to Governor Morehead School was that I was taught the trade of tuning pianos. After learning this trade, we were allowed to go off campus and take private jobs. I worked very hard at test tuning jobs, and by the tenth grade I was able to buy my own set of tuning tools. With these tools I was able to obtain enough spare time work to later buy ham radio equipment.

I decided in the eleventh grade to obtain my ham radio license. I had already learned some code in our boy scout troop, and this helped give me a small start. The scoutmaster had also been a ham operator, and he brought his key and oscillator and let us examine and experiment with it. That really did whet the interest. I definitely decided that my hobby for life would be ham radio.

During the same year, I met a high school senior from Millbrook High School, Norman Gorsuch. He lived across town but would come over on Sunday afternoons and help me study theory and code. We were able to get some material from Southeastern Radio Supply in

question and answer form. Norman read the material to me until I was able to memorize enough to obtain my novice ticket.

I am afraid many a study hall which was supposed to have been devoted to school work was devoted very sincerely to Morse code and radio theory. Thinking back, with my interest in radio and my budding interest in girls, it's a wonder I wasn't asked to repeat the eleventh grade.

My labors were rewarded in both cases, however. In March 1959 I took my exam and received a novice ticket in May, just a few weeks before school was to close for the summer.

My interest in radio grew. I have very fond memories of visiting Radio Station WHNC in Henderson on summer visits home. The people were very patient. They showed me all kinds of marvelous gadgets, and I loved every minute of it.

Because of tuning jobs, I was able to buy a Halli-crafters S40-B receiver, a Heath Kit DX-40 transmitter, a microphone, VFO, antenna wire, coaxial cable, and the other things necessary to

get on the air. Norman Gorsuch, K4AGL, and his father put it together for me. They brought it over a few weeks before school was out. We fired it up and it worked. I was absolutely overjoyed.

When I went home for summer vacation, my brother helped me build and put up a long wire antenna. We knew nothing about SWR and the long wire cut down on some of the problems. In those days, if it would load, it was all right.

I really enjoyed operating as a novice that summer. My first call sign was KN4IAS. I had one crystal for 3725 kHz on 80 meters, and I worked 45 or 46 states on that frequency. I had miscellaneous chores to do around the house and farm, but every extra minute was spent with my radio. Sometimes I would ham nearly all night.

When time permitted, my brother and I put up a dipole antenna. We went into the woods and cut two trees for poles. Using posthole diggers, we erected the poles in a field near the house. As far as I know, the poles are still there.

My brothers and sisters helped me study for the conditional license test which I took late that summer. The conditional ticket arrived early in September, after I had begun my senior year at Governor Morehead School. The school superintendent permitted me to convert a basement room in my dorm to a radio shack. With my conditional ticket, I was able to get on the phone portion of the band. I made several nice contacts on 80 meters during the school year using a dipole antenna I made. Since I took my education a little more seriously that year, I didn't have nearly as much time to ham as I would have liked.

I graduated from high school at Governor Morehead in 1960. I lived with a Raleigh family, tuning pianos for a living and hamming for pleasure until I went to Brigham Young University at Provo, Utah in the spring of 1961. I attended for a year. For the next several years I worked in Virginia tuning pianos in Rocky Mount and South Boston. I secured a contract with Raleigh City Schools in 1964 and settled in Raleigh.

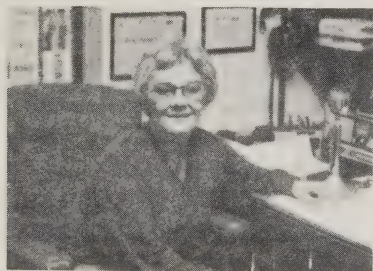
In 1976 I lost what little vision I had because of glaucoma. I began working with the Small Business Enterprises Division of Services for the Blind operating a concession stand, my present employment.

I am 40 years old, living on George Town Road in Raleigh. I am happily married and still enjoying my radio.

When Mr. West requests another article, you will know a little about me.

73s.

MINUTES OF LAST MEETING



ANN BRADLEY, WA4APK

Secretary, RARS

The regular monthly meeting of the Raleigh Amateur Radio Society was held in the West Community Room at Crabtree Valley Mall on Sept. 3, 1980. The meeting was called to order by President "Doc" Cobb, W4YZX

and members and guests were welcomed. A number of guests were recognized: Marshall Sanderson, KB4PM, Raleigh; Lynn Muchmore, KM4S, Knightdale; Don Turner, WA4RFJ, Raleigh; Russell Worthington, WA4POD, Raleigh. The roster was signed by 47 persons.

George Richards, WA4EKJ, reported that the power on the repeater has been down during August. However, the original exciter which has been completely reworked and also the PA will go in within the next weekend or so and will definitely be back up to power in time for the hospital move. At the November meeting, there will be a program on the use of the auto patch. Members are asked to bring their rigs so they can be checked out. Instructions and pertinent information will be given at that time. There is still a need for daytime control operators for the autopatch. Anyone willing to help, please call George.

Bert Bailey, W4FMN, updated the information concerning the hospital move and again, asked volunteers to sign up for particular control points. There will be 3 busses to move patients and there will be a need for 3 handi-talkies with mag-mounts. Also needed are several base stations as well as back-up equipment for all. There will be a practice run on Saturday, Sept. 20, and the actual move will take place on Sunday, Sept. 28. This is a chance for RARS to make a name for itself in the community. Let's don't fall short!

Rollin Ransom, N4AWR, Hamfest Chairman, asked for people to help sort out last year's ticket stubs for duplications in order to come up with a new mailing list. Several people were willing to help. Rollin will let us know when.

The evening's program was a lecture and demonstration on Antenna Tuners given by Bob Johnson, AA4L, "by proxy." Unfortunately, Bob was called to Japan. Rollin Ransom, N4AWR, played Bob's tape, showed Bob's equipment, pointed out Bob's diagrams, turned the tape at exactly the right moment, and even did a little pantomime. The members enjoyed Bob's lecture and Rollin's antics.

C. T. West, WD4HSI, recognized the newsletter's regular columnists and congratulated them for their work. Others are asked to submit copy to contribute to the continuing success of the newsletter.

In the near future - probably by the next meeting - a committee will present a financial report and a proposed budget for the upcoming year. In view of the current inflationary prices, it appears that RARS will be forced to ask for an increase in dues. Members are asked to be thinking about this probability.

Doc reminded members that they may be due a rebate for charges made for licenses in the past. Doc will try to secure forms for the membership to apply for these refunds.

Also a reminder that Amateur call license plate applications are due October 1.

The drawing was held for the door prize with Ed Stephenson, AB4S, winning the 1980 Radio Amateur's Handbook. The meeting was adjourned following coffee, do-nuts, and fellowship.

BERT'S BEAT
WITH
BERT BAILEY, W4FMN



BALANCED MODULATORS,
MIXERS*****
Keep reading about balanced modulators, mixers, single, double, and all that good stuff. Great! What are they? Each use diodes so they can be used as amplitude modulators and demodulators as well as mixers. So modulators, mixers, smmixers. All the samo-samo. If you call the input freqs f_{rf} and f_{lo} then call the device a mixer. If you call the inputs f_c and f_m (for carrier and modulating), then, br my guest, call them modulators. We all heard of

balanced mods when we went SSB. The latest trend is in mixers, tho. So call 'em mixers. The diodes in these circuits acts as switches and give as outputs, one output freq, generally referred to as the "IF", or intermediate freq, f_{if}. With the single balanced mixer, you wind up with two output freqs, to include f_{rf}. This may not be so good. So, instead of adding another expensive filter, you can go to double-balanced mixers and get only one freq out, the IF. To achieve isolation between the 3 ports of

the DBM, CT transformers are used. Trace the current and see only one output. Now you can see that our old friend, the balanced modulators of SSB fame is really a single-balanced device since the output is two SBs. And remember we got rid of the one SB by either the brute force technique (filter) or by, more fun, phasing ala the venerable HT37. So now you know all about balance modulators and mixers. Maybe the next time you order one, you'll get the right one. HiHi.

W4FMN, OES

COMPARATORS

W4FMN

Most electronic systems contain both analog and digital circuits. Neither exist as separate units but, rather, complement each other. In the vernacular, they are interfaced. They convert one form to the other. We hear, for instance of analog-to-digital convertors (ADC) as well as DACs. Modern electronic systems are computer or microcomputer controlled. Coded digital info is transmitted to and from the computer to a part of the system where the analog functions are carried out, e.g. measurements, control, testing or detecting. The ADCs and DACs operate at the systems level and generally implemented with

linear devices. At the circuits themselves however, a comparator does the converting from analog to digital. It is a 2-input, 1 output voltage amplifying linear device that has high gain, low Z-out and high Z-in. Sound familiar? It should,---it's an op-amp. But we were talking about comparators. Well, the op amp can, and is used as a comparator. Yet each performs different functions. The comparator differs from the op-amp because it operates open-loop. The op-amp is closed loop operated. The comparator is much faster, e.g. 20 usec to 0.1 usec. And the comparator has two output states whose voltage levels are based purely on whether one input is greater or less than the other. There are no in-betweens. With the op amp, both inputs track each other and the output voltage is linearly related to the input and can be any value within the saturation limits of the device. There are more intricate ~~AND~~ complex inter-relationships between these two comparable, yet different, devices. However, perhaps this short expose has helped clarify the differences for some. My students at Wake Tech, some in Electronics and some in Computers, occasionally mixed them up. So I hope this clarifies matters.

*****Bert W4FMN**OES*****

RARS meets each first Wednesday at 7:30 p.m. in the
West Community Room of Crabtree Valley Mall.

JOGGING HAMS

Couple of weekends ago, I ran the 10K in Sanford. In a driving rain and up steep hills yet. Never having met a ham on this type of driving circuit, I was greatly surprised to hear my name AND call mentioned as a gasping runner pulled up along side me to converse. After advising the friendly ham that all I could do was one thing at a time, not combine talking AND dying, he said he was WB4BBY Don of Durham and as he went by I bid him Bon Voyage. Later, I passed Don as he quit going up the last hill. I staggered by him, aided by a man in a wheelchair going up backwards who admonished me, between gritted teeth, "DON'T QUIT!" (How about that! Courage Raw-type). So

I felt good, beat out the only other ham in the ratrace. BUT, 100 yards down the road, here comes ole BBJ, sweeping by my tired old bones to beat me at the finish by 6 seconds. Only 48 minutes but don't knock it till you try it, my friend, at ages beyond 50. (Not Don, he's about 29, my guess).

My big point is, how many hams do we have out there who would ^{like} to form a team at these races? Very few are formed at the races I've run --and I'm just a novice-- but with the paucity of teams I have seen entered, looks like RARS could add to its collection something besides QSL cards, altho it would take a little sweat at times. Think on this and if interested, see a jogger (at the halt that is). Yours for good DC--distant chasing! And hope it's 43 and not 73.

.....Bert W4FMN.....

1980 NEW BERN HAMFEST

LOCATION: NEW BERN (N. C.)
Craven County FAIRGROUNDS
ON U. S. 70, 3.5 miles
EAST OF NEW BERN

TIME: 0900 - 1800, SUNDAY,
October 12, 1980



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Calendar

September 28

RARS provides communications
for moving of patients from
old hospital to new Rex
Hospital in Raleigh

October 1

Regular RARS meeting

October 4,5

Virginia State Convention
at Virginia Beach

October 5

Rock Hill, S. C. Hamfest

October 11

Autumnfest, Asheville,
N.C.

October 12

New Bern, N. C. Hamfest

October 15

RARS Advisory Board
meeting

November 5

Regular RARS meeting and
annual auction.

November 5, 6

FCC exams at Wilmington,
N.C.